



# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in a Motion Picture Camera for Taking Pictures which can be Reproduced in Color

We, COLOR RESEARCH CORP., a corporation organized under the laws of the State of Delaware, United States of America, of 630, Fifth Avenue, in the City, County and State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in motion picture cameras for taking pictures which can be reproduced in color.

An object of this invention is to provide improvements in motion picture cameras for taking pictures suitable for reproduction in color by the color reseau process.

More specifically this invention relates to improvements of this type which may be applied to the well known Mitchell camera.

A more detailed object of the invention is to provide a novel method of mounting a color-matrix or reseau in the aperture plate of the camera.

Another object of the invention is to provide a mechanism for moving the film out of contact with the aperture plate during the periods of movement of the film in its usual step-by-step movement.

Still another object of the invention is to provide a mechanism for insuring a substantially uniform contact between the film and the color-matrix or reseau during taking.

Still another object of the invention is to provide cleaning mechanism for the film operative to clean the film before it reaches the aperture plate.

Other objects of the invention will be apparent from the following description of the embodiment thereof disclosed in the attached drawings.

In the accompanying drawings:—

Figure 1 is a side elevational view partly in vertical cross section on the line 1—1 of Figure 2 of the film pull-down

mechanism of a Mitchell camera;

Figure 2 is a perspective view of the aperture plate from the inside of the camera;

Figure 3 is a similar view from the outside;

Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 2; and

Figure 5 is a detailed perspective view of one of the shoes which move the film out of contact with the aperture plate during the pull-down operation.

The two best known color photography processes employing a color-matrix or reseau are the Finlay and the Dufay processes. In the Finlay process the color-matrix is printed on a glass plate and the sensitized plate upon which the picture is to be taken is placed in intimate contact with the printed side of the color-matrix during exposure. The exposed plate is developed afterwards as a separate black and white record of the scene photographed. This record can be viewed in color by placing it in contact with a similar color-matrix properly registered therewith. In the Dufay process the color-matrix is printed on a transparent film which is then coated with a sensitive emulsion. After exposure and development the recorded picture appears in color, the matrix and the developed record being inseparable.

The Finlay color-matrix being very coarse, the glass plates are of necessity quite large, and therefore difficult to clean when placing the sensitized plate in contact with them, and a further difficulty lies in securing perfect contact over so large an area.

In the Dufay process the color-matrix being printed on the transparent film base is continuous throughout the length of the film. It is well known that color-matrices or reseaus are difficult and expensive to make and even with the greatest care contain many blemishes which inter-

[Price 2/-]

ferre greatly with the quality of the pictures produced thereby.

According to the present invention a motion picture camera for taking pictures which can be reproduced in color, is provided including in combination, an aperture plate having an aperture therein defined by raised surfaces, a color réseau mounted in said aperture in the plane of said raised faces, a reciprocable pressure plate and an intermittent film feeding mechanism, means for engaging and disengaging the pressure plate and film, means for disengaging the film from the raised aperture defining areas during periods of film movement, and film cleaning means positioned to clean the film just before it moves into registry with said réseau.

The invention herein disclosed is further concerned with a motion picture camera which can be used with a color-matrix separate from the sensitive film. The basic elements of this invention are a color-matrix suitable for motion picture work which due to its small size can be made substantially physically perfect in combination with means to insure that the film immediately before contact with the color-matrix is entirely free from dust particles, and means to move the film away from or out of contact with the color matrix while it is in the process of being pulled down by the intermittent feed mechanism. The combination is further characterized in that after each pull-down the film is brought back into contact with the color-matrix by a suitable pressure pad, which insures intimate contact of the area to be exposed with the color-matrix. The practical utility of such a combination is that neither the color-matrix nor the film will be marred during the process.

In view of the above it will be seen that a broad object of this invention is to obtain a motion picture record in black and white of a scene in color which may after development be utilized to reproduce the scene in its original color by recombining it in an appropriate manner with a color-matrix similar to that employed in photographing the scene.

The portion of the mechanism of a Mitchell camera which has been illustrated in Figure 1 will be referred to only briefly because it is a well known mechanism in this art.

As illustrated, the operating mechanism is mounted upon a supporting plate 1. The aperture plate 2 is detachably secured to the plate 1 by means of machine screws 3 and 4 so that the two plates are held in right angle relationship as illustrated. The usual pull-down claw 5 is

provided with film perforation engaging pins which oscillate in the vertical slot 8 in the aperture plate in a well known manner.

Much of the mechanism illustrated is for effecting this oscillating motion which is accompanied by a movement of the claw towards and away from the aperture plate as is well understood. As is usually the case the registering pins 7, which pass through the perforations of the film and into the apertures 7<sup>a</sup> in the aperture plate, are mounted on a reciprocable shaft 7 and at the proper time enter the perforations to accurately position the film in the aperture. Some of the mechanism illustrated is for reciprocating the shaft 7 at the proper time. Slidably mounted on a plate 8 is a spring biased pressure shoe 9 for clamping the film against the aperture plate in the region of the aperture. The plate 8 is mounted upon a lever 10 which can oscillate to cause this clamping action at the proper time and the remainder of the illustrated mechanism is for effecting this oscillation at the proper time. The mechanism so far described is referred to to provide a background for the improvements of this invention but this mechanism forms no part of the novel subject matter herein disclosed.

The film F which is the usual motion picture film passes from the supply reel, not shown, over a guide roller 11 mounted on the plate 1 to the passage formed between the aperture plate 2 and the pressure shoe 9, as illustrated in Fig. 1. It passes down along the aperture plate issuing at the bottom thereof, around the guide roller 11<sup>a</sup> and back to the take-up reel, not shown. The normal movement and feed of such a film will cause it to tend to arch upwardly between the guide roller 11 and the entrance to the guideway. Advantage is taken of this to provide mechanism for cleaning lint, dust and other forms of material from the face of the film which engages the aperture plate. The cleaning mechanism includes a brush 12, preferably of sable which is of a width equal to the width of the film. This brush is mounted upon an arm 13 which is pivotally adjustable on a screw 14 attached to the bracket 15. The bracket 15 is detachably secured to the plate 1 by means of a locking member 16 of any suitable construction and is accurately positioned by means of the registration pins 17. The bracket 15 is provided with an integral downwardly extending arm 18 upon which is mounted a pad of velvet or other suitable cleaning fabric 19 also having a width substantially equal to the width of the film. The natural upward pressure which the film in its normal

movements creates against the brush 12 and the pad 19 serves effectively to remove all of the dust, lint and the like from the film just before it enters the

5 guideway.

The aperture plate 2 is provided with the exposure aperture 20 in which is mounted a color-matrix or reseau of any suitable construction. For example, this reseau may consist of an optical flat 21 of glass upon which is printed or otherwise applied in the form of extremely small dots or bars the usual colors red, green and blue. The glass plate 21 is secured to a pair of L-shaped brackets 22 in any suitable manner as by cementing. These brackets fit into the aperture plate 2 and serve to secure the glass plate in place. The brackets may be attached by machine screws as shown. Referring to Figure 2, it will be seen that the inner face of the aperture plate is so constructed as to form a raised frame about the aperture. This frame comprises the side rails 23 and 24 and the top and bottom rails 25 and 26 by undercutting the aperture plate as illustrated. A raised rectangular frame lies around the periphery of the opening 20 with all of the surfaces 23, 24, 25 and 26 in the same plane and in the plane of the inner colored face of the glass plate 21. Since the portions of the aperture plate bordering the frame are undercut as illustrated, the surfaces 23, 24, 25 and 26 are referred to hereinafter and in the claims as the "raised surfaces" which define the aperture.

In the region of the rails 23 and 24 are a pair of elongated apertures 27 which extend along the sides of the aperture 20 for a distance substantially equal to the width thereof. Slidably mounted in these apertures are a pair of shoes 28 which are mounted so as to be spring loaded. Referring to Figure 4, it will be seen that these shoes are provided with screws 29 having slotted heads in which the ends of a straight spring wire 30 rest. If desired, to prevent the shoes from falling away from the wires 30, the slotted heads may have a snap or pinching cooperation with the ends of the wires 30 to prevent their disengagement. The other ends of these wires are locked to the aperture plate by set screws 31. From a study of the figures it will be seen that the spring wires 30 urge the shoes 28 rearwardly or in the direction to move the film out of contact with the raised aperture framing surfaces 23, 24, 25 and 26. When the pressure shoe 9 is withdrawn during periods of step-by-step movement of the film, these shoes serve to prevent scratching of the film by moving it out of contact with the raised surface and the color reseau dur-

ing this movement. It will be understood, of course, that the pressure shoe 9 extends transversely throughout the width of the film so that it acts to retract the pressure shoes 28 back to a flush position with the raised surfaces 23 and 24 when the pressure plate is clamping the film in the aperture. It will be noted that the shoes 28 engage the film outside of its picture or frame area so that any scratching that they might cause will not mar the picture area and further cause the film to follow the reciprocating motion of the pressure plate very closely.

It will be understood that the cleaning mechanism insures that the film will arrive at the aperture plate in a clean condition. This is important in order that the film will lie as nearly perfectly in contact with the inner face of the reseau 21 as is possible to obtain a practical operation. The pressure shoe will, of course, act to cause the film to contact the reseau throughout its area with an efficiency depending upon how little dust and lint lies between the film and the reseau. The pressure shoes 28 will insure that during the pull-down operation the film will not drag along the raised surfaces outlining the aperture 20, minimizing the usual tendency to scratch the film and any tendency to mar the color reseau.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A motion picture camera for taking pictures which can be reproduced in color, including in combination, an aperture plate having an aperture therein defined by raised surfaces, a color reseau mounted in said aperture in the plane of said raised faces, a reciprocable pressure plate and an intermittent film feeding mechanism, means for engaging and disengaging the pressure plate and film, means for disengaging the film from the raised aperture defining areas during periods of film movement, and film cleaning means positioned to clean the film just before it moves into registry with said reseau.

2. The combination of claim 1, wherein the means for disengaging the film from the raised aperture defining areas during periods of film movement comprise a pair of resiliently mounted pressure shoes mounted adjacent the sides of the aperture.

3. In the combination of claim 2, the pressure shoes being spring biased and slidably mounted in elongated openings formed in the aperture plate surfaces.

4. The combination of claim 1, wherein

the means for disengaging the film from the raised aperture defining areas during periods of film movement are forced to retracted position by the pressure plate when in clamping position.

5 5. In the combination of claim 1, means for detachably mounting the reseau as a unit on the aperture plate.

10 6. In the combination of claim 1, the aperture plate and pressure plate forming a film guideway, and means for supporting the film so that it follows a curved path therefrom to the guideway, the film cleaning means comprising wiping devices 15 engaged by the film under pressure due to the natural resiliency of the film.

7. In the combination of claim 6, the

film cleaning means comprising a detachable support having a pair of spaced film wiping devices mounted thereon.

8. In the combination of claim 6, the film wiping devices including a brush, or a velvet pad, or both.

9. A motion picture camera for taking pictures which can be reproduced in color 25 as herein described with reference to the accompanying drawings.

Dated this 17th day of June, 1917.

For the Applicants,

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[This Drawing is a reproduction of the Original on a reduced scale.]

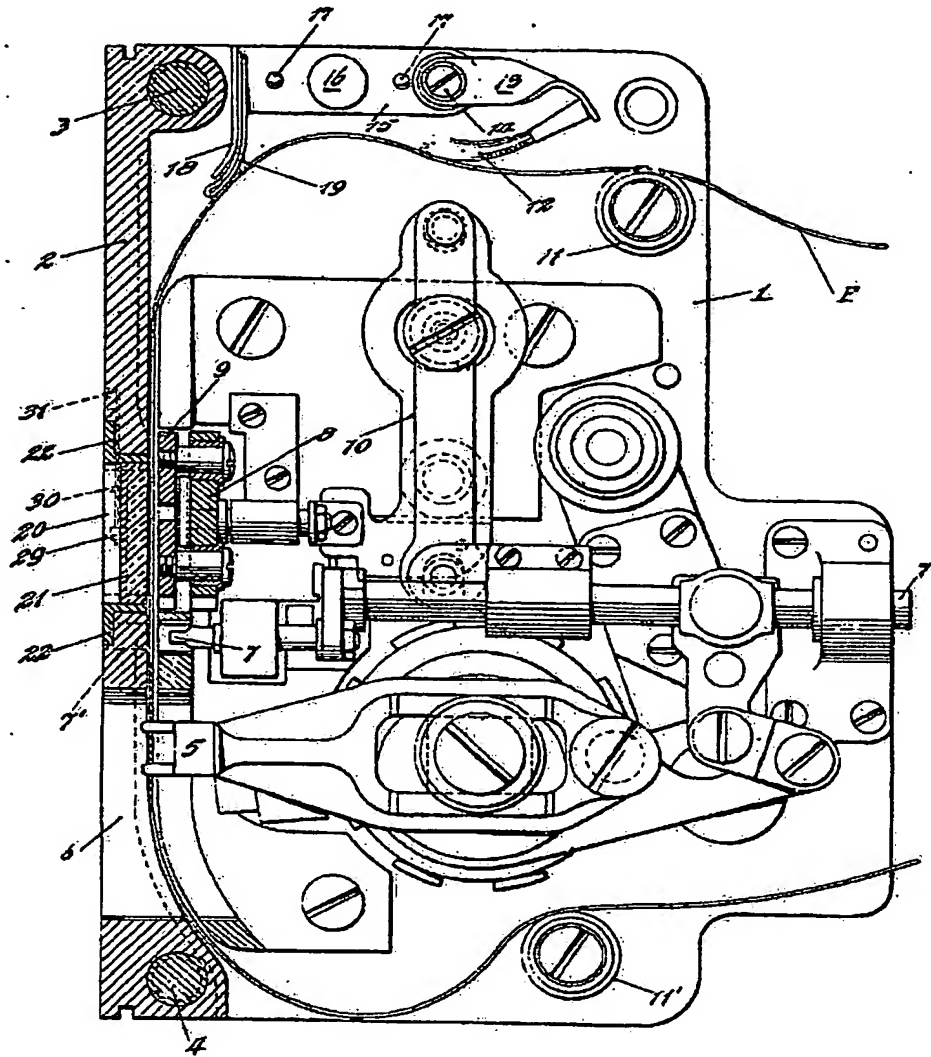


Fig. 1.

SHEET 1

2 SHEETS

SHEET 2

Fig. 2.

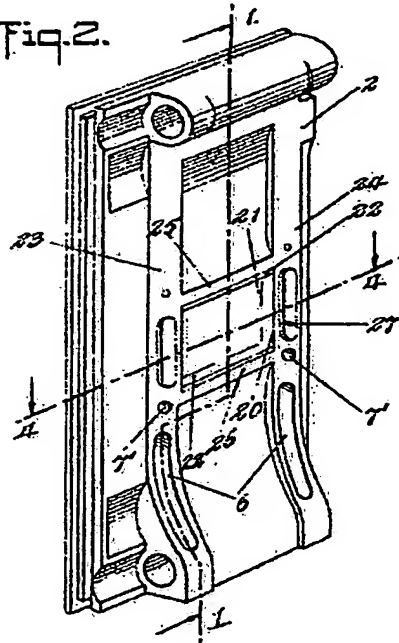


Fig. 3.

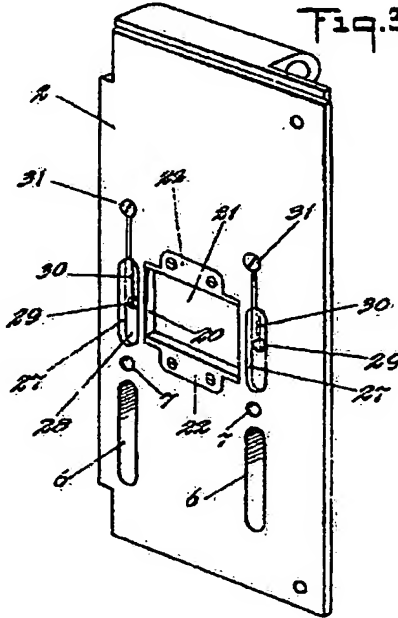


Fig. 4.

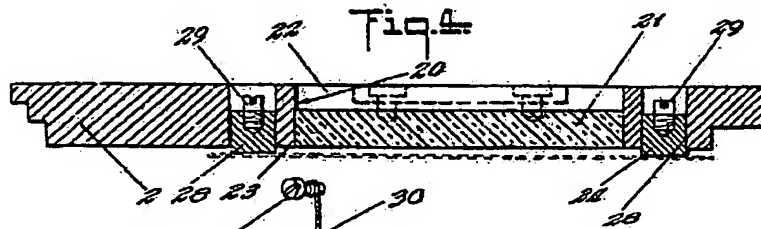
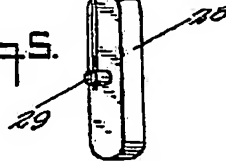
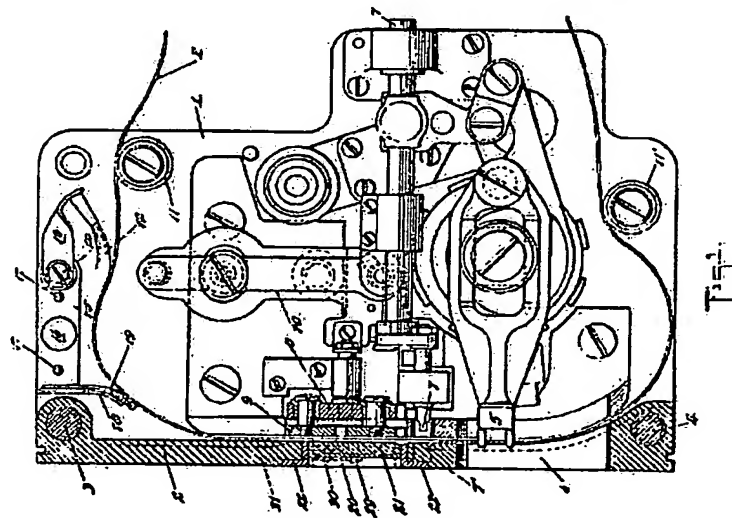


Fig. 5.

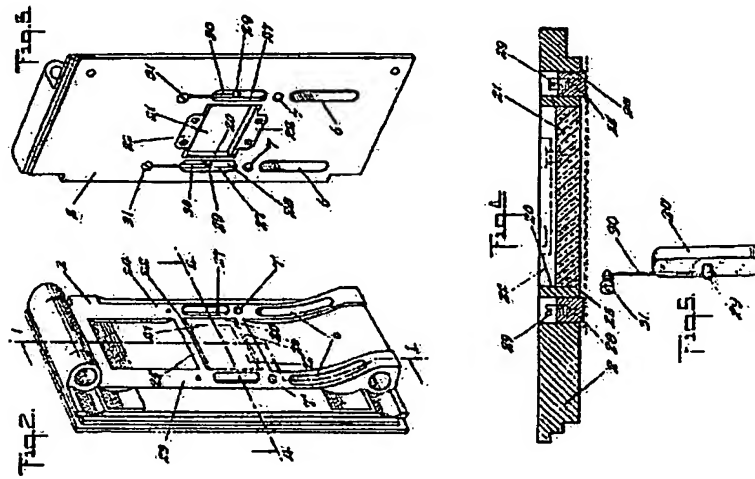


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Fig. 2.